Biodiversity Data Journal 6: e22622
doi: 10.3897/BDJ.6.e22622

Data Paper

A dataset on the species composition of amphipods (Crustacea) in a Mexican marine national park: Alacranes Reef, Yucatan

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Academic editor: Yasen Mutafchiev

Received: 29 Nov 2017 | Accepted: 16 Jan 2018 | Published: 25 Jan 2018

Citation: Paz-Ríos C, Simões N, Pech D (2018) A dataset on the species composition of amphipods (Crustacea) in a Mexican marine national park: Alacranes Reef, Yucatan. Biodiversity Data Journal 6: e22622. https://doi.org/10.3897/BDJ.6.e22622

Abstract

Background

Alacranes Reef was declared as a National Marine Park in 1994. Since then, many efforts have been made to inventory its biodiversity. However, groups such as amphipods have been underestimated or not considered when benthic invertebrates were inventoried. Here we present a dataset that contributes to the knowledge of benthic amphipods (Crustacea, Peracarida) from the inner lagoon habitats from the Alacranes Reef National Park, the largest coral reef ecosystem in the Gulf of Mexico. The dataset contains information on records collected from 2009 to 2011. Data are available through Global Biodiversity Information Facility (GBIF).

New information

A total of 110 amphipod species distributed in 93 nominal species and 17 generic species, belonging to 71 genera, 33 families and three suborders are presented here. This information represents the first online dataset of amphipods from the Alacranes Reef National Park. The biological material is currently deposited in the crustacean collection from the regional unit of the National Autonomous University of Mexico located at Sisal, Yucatan, Mexico (UAS-Sisal). The biological material includes 588 data records with a total abundance of 6,551 organisms. The species inventory represents, until now, the richest fauna of benthic amphipods registered from any discrete coral reef ecosystem in Mexico.

Keywords

Amphipoda, Peracarida, Macrofauna, Benthos, Species diversity, Coral Reef, Campeche Bank, Gulf of Mexico, occurrence record

Introduction

Alacranes Reef is a highly diverse protected coral reef ecosystem, located in the southern sector of the Gulf of México. It is considered as one of the largest coral reefs of the Gulf of Mexico (Liceaga-Correa and Hernández-Núñez 2000, Tunnell et al. 2007a). It was declared as a National Marine Park by the Mexican government in 1994 and as a Biosphere Reserve, by the UNESCO, in 2006. Since its declaration as a National Park, Alacranes Reef has been subject to different efforts to inventory its biodiversity, however, this task is not fulfilled until now. Recent studies on reef-associated benthic fauna include sea anemones (González-Muñoz et al. 2013), decapod crustaceans (Santana-Moreno et al. 2013), polychaetes (Ramírez-Hernández et al. 2015), sponges (Ugalde et al. 2015) and mollusks (Reyes-Gómez et al. 2017).The peracarid crustaceans, such as the amphipods, are one of the underestimated groups not considered in the main inventory lists reported for the reef (CONANP 2006, Tunnell et al. 2007b). The scarce evidence describing the richness of amphipods on the Alacranes reef (Paz-Ríos et al. 2014, Paz-Ríos et al. 2013a, Paz-Ríos et al. 2013b) has pointed out the relevance of this group as one of the most diverse in the entire reef ecosystem. The present contribution intends to show the high species richness of benthic amphipods inhabiting the bottom habitats from the inner reef lagoon by providing a dataset with taxonomic checklist. This checklist constitutes the first formal effort to inventory the biodiversity of such group in the Alacranes Reef ecosystem.

Project description

Title: Alacranes Reef Biodiversity Expedition.

Personnel: Carlos Enrique Paz Ríos and Nuno Simões.

Design description: The dataset was composed using information from benthic macrofauna samples randomly collected on different benthic habitats and artificial substrates between 2009 and 2011, mostly in the inner lagoon of Alacranes reef.

Funding: Resources included funds to NS from the National Autonomous University of Mexico (UNAM) for supporting academic research (PAPIME-PE207210), funds from the Mexican Government for scientific research (SEMARNAT-CONACyT108285) and an international cooperation for marine scientific research between Mexico and USA (HRI-CONABIO-NE018) through the project "Actualización del conocimiento de la diversidad de especies de invertebrados marinos bentónicos de aguas someras (<50 m) del Sur del Golfo de México". Funds to CEPR was provided by CONACyT scholarship.

Sampling methods

Study extent: The dataset contains information on amphipods collected from three different expeditions: the first one in August 2009, the second one in April 2010 and the third one in October 2011. In each expedition a relatively high diversity of habitats was explored in order to increase the chance to capture the species diversity. In the 2010 and 2011 expeditions, special effort was made to collect information on navigation buoys and two wood docks nearby a sand island (isla Perez).

Sampling description: Amphipods were collected from 50 sampling sites: Forty-one randomly distributed on natural habitats from the inner lagoon, including different benthic habitats (i.e. bare substrate, seagrass bed, coral patch, reef wall) and nine collected on artificial substrates (i.e. buoy, wood dock, lobster tramp). Diverse sampling devices were employed: PVC core for sandy substrates, shovel for patches of intertidal sand, suction device sampler for coral rubble, sand and shallow coral reef flats and, finally, a Riley push-net and trawl for shallow seagrass beds of *Thalassia testudinum* (Banks ex König, 1805).

Quality control: Amphipod species were sorted and identified to the lowest possible taxonomical category, using specialised literature such as keys for identification, e.g. Myers (1981), Lowry and Stoddart (1997), LeCroy (2000) and illustrated guides, e.g. Winfield et al. (2007), Ortiz et al. (2014). The taxonomical arrangement used herein follows Lowry and Myers (2017). Nine species were identified as possibly new species and were represented at the genus category (i.e. *Bemlos*, *Elasmopus*, *Idunella*, *Harpinia*, *Leucothoe*, *Maera*, *Psammogammarus*); further specialised taxonomical effort will be needed before assigning a name. Species names were matched using the *Taxon Match* tool in the World Register of Marine Species (WoRMS) in order to corroborate, standardise and update if necessary. Sampling points in the reef, available in the Data resources (see below), were georeferenced and displayed into different maps using different software (i.e. QGIS®, ArcView GIS®, and Google Maps®).

Step description: Once collected, the amphipods were first anaesthetised with magnesium chloride (4%) for 15 to 20 min. and then fixed with formaldehyde solution (10%) buffered with seawater before storage. In the laboratory, samples were washed through a 500 µm size mesh and preserved with 70% of ethanol solution. Finally, the organisms were stored in glass containers with a catalogue number according to the regional collection 'Crustáceos de Yucatán' (YUC-CC-255-11), from the 'Universidad Nacional Autónoma de México, Unidad Sisal' Mexico.

Geographic coverage

Description: The Alacranes Reef, Yucatan, Mexico (Fig. 1), is located in the Campeche/ Yucatanean Outer Neritic area (Wilkinson et al. 2009) forming part of the North America's marine ecoregion 14 (Southern Gulf of Mexico). It is a platform reef type with a semi-elliptic shape, covering an area larger than 650 km^2 (Liceaga-Correa and Hernández-Núñez 2000).

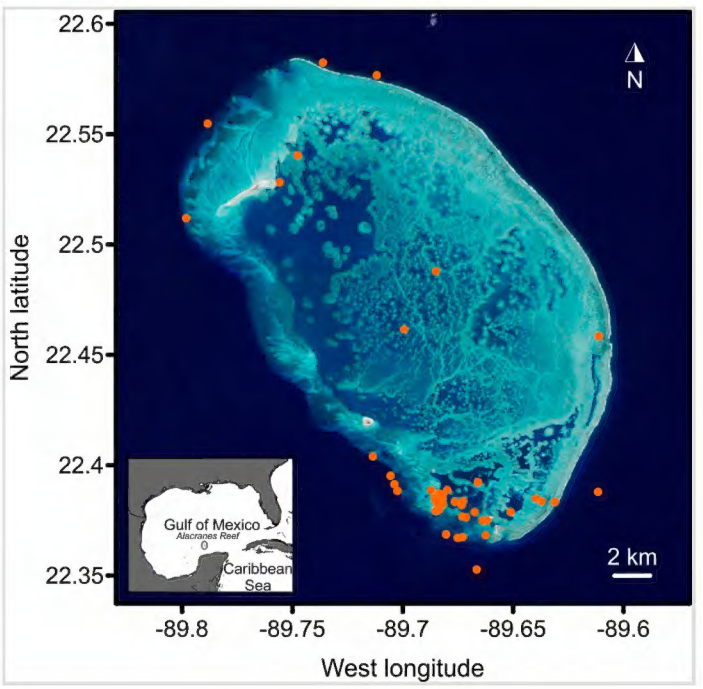

Figure 1. doi

Location of sampling points in the Alacranes Reef National Park. The image from the NASA Earth Observatory, was acquired by Jesse Allen on November 5, 2014, by the Operation Land Imager on Landsat 8.

Coordinates: 22.337 and 22.605 North Latitude; -89.549 and -89.852 West Longitude.

Taxonomic coverage

Description: The dataset contains information on 110 species (93 nominal species and 17 generic species), belonging to 71 genera, 33 families and three suborders. The suborder Amphilochidea was composed of 46 species, 28 genera and 13 families, the suborder

Colomastigidea by 6 species, 1 genus and 1 family and the suborder Senticaudata by 58 species, 42 genera and 19 families (Table 1). Regardless suborder, 6 families presented the highest numbers of species, accounting for the 50% of all the fauna in the reef: Ampithoidae (6 spp.), Colomastigidae (6 spp.), Lysianassidae (8 spp.), Leucothoidae (11 spp.), Maeridae (12 spp.) and Aoridae (13 spp.).

Table 1.

Checklist of benthic amphipod species in the Alacranes Reef, Yucatan.

Suborder	Family	Species
Amphilochidea	Ampeliscidae	*Ampelisca brevisimulata* Barnard, 1954
		Ampelisca cristata Holmes, 1908
		Ampelisca schellenbergi Shoemaker, 1933
		Ampelisca vadorum Mills, 1963
	Amphilochidae	*Apolochus delacaya* (McKinney, 1978)
		Apolochus sp.
	Bateidae	*Batea carinata* (Shoemaker, 1926)
		Batea cuspidata (Shoemaker, 1926)
	Cyproideidae	*Hoplopheonoides obesa* Shoemaker, 1956
	Dexaminidae	*Dexaminella* sp.
		Notrotopis minikoi (Walker, 1905)
	Leucothoidae	*Anamixis cavatura* Thomas, 1997
		Anamixis vanga Thomas, 1997
		Leucothoe ashleyae Thomas & Klebba, 2006
		Leucothoe barana Thomas & Klebba, 2007
		Leucothoe hendrickxi Winfield & Álvarez, 2009
		Leucothoe kensleyi Thomas & Klebba, 2005
		Leucothoe laurensi Thomas & Ortiz, 1995
		Leucothoe saron Thomas & Klebba, 2007
		Leucothoe ubouhu Thomas & Klebba, 2007
		Leucothoe wuriti Thomas & Klebba, 2007
		Leucothoe sp.
	Liljeborgiidae	*Liljeborgia bousfieldi* McKinney, 1979
		Liljeborgia sp.

		Idunella barnardi (Wigley, 1966)
		Idunella sp.
	Lysianassidae	*Aruga holmesi* Barnard, 1955
		Concarnes concavus (Shoemaker, 1933)
		Ensayara entrichoma Gable & Lazo-Wasem, 1990
		Hippomedon sp.
		Lepidepecreum madagascarensis (Ledoyer, 1986)
		Lysianopsis alba (Holmes, 1905)
		Orchomenella thomasi Lowry & Stoddart, 1997
		Shoemakerella cubensis (Stebbing, 1897)
	Oedicerotidae	*Americhelidium americanum* (Bousfield, 1973)
		Hartmanodes nyei (Shoemaker, 1933)
		Perioculodes cerasinus Thomas & Barnard, 1985
	Phoxocephalidae	*Eobrolgus spinosus* (Holmes, 1905)
		Harpinia sp.
		Metharpinia floridana (Shoemaker, 1933)
		Rhepoxynius sp.
	Platyischnopidae	*Eudevenopus honduranus* Thomas & Barnard, 1983
	Sebidae	*Seba tropica* McKinney, 1980
	Stenothoidae	*Stenothoe gallensis* Walker, 1904
		Stenothoe valida Dana, 1853
		Stenothoe sp.
Colomastigidea	Colomastigidae	*Colomastix denticornis* LeCroy, 1995
		Colomastix falcirama LeCroy, 1995
		Colomastix heardi LeCroy, 1995
		Colomastix irciniae LeCroy, 1995
		Colomastix tridentata LeCroy, 1995
		Colomastix sp.
Senticaudata	Ampithoidae	*Ampithoe marcuzzii* Ruffo, 1954
		Ampithoe ramondi Audouin, 1826
		Ampithoe valida Smith, 1873

	Cymadusa compta (Smith, 1873)
	Cymadusa filosa Savigni, 1816
	Pseudamphithoides incurvaria (Just, 1977)
Aoridae	*Bemlos dentischium* (Myers, 1977)
	Bemlos kunkelae (Myers, 1977)
	Bemlos longicornis Myers, 1978
	Bemlos spinicarpus (Pearse, 1912)
	Bemlos unicornis (Bynum & Fox, 1977)
	Bemlos sp.
	Globosolembos smithi (Holmes, 1905)
	Grandidierella bonnieroides Coutiere, 1904
	Lembos unifasciatus reductus Myers, 1979
	Lembos unifasciatus unifasciatus Myers, 1977
	Paramicrodeutopus myersi (Bynum & Fox, 1977)
	Plesiolembos ovalipes (Myers, 1979)
	Plesiolembos rectangulatus (Myers, 1977)
Caprellidae	*Deutella caribensis* Guerra-García, Krapp-Schickel & Müller, 2006
	Hemiaegina minuta Mayer, 1890
	Metaprotella hummelincki (McCain, 1968)
Eriopisidae	*Netamelita tabaci* Thomas & Barnard, 1991
	Psammogammarus sp.
Hadziidae	*Protohadzia schoenerae* (Fox, 1973)
Hornelliidae	*Hornellia* (*Metaceradocus*) *tequestae* Thomas & Barnard, 1986
Hyalidae	*Parhyale hawaiensis* (Dana, 1853)
	Protohyale (*Protohyale*) *macrodactyla* (Stebbing, 1899)
Ischyroceridae	*Ambicholestes* (*Ambicholestes*) *crassicornis* (Just, 1984)
	Ericthonius punctatus (Bate, 1857)
	Ericthonius sp.
Maeridae	*Anamaera hixoni* Thomas & Barnard, 1985
	Ceradocus rubromaculatus (Stimpson, 1856)
	Ceradocus (*Denticeradocus*) *sheardi* Shoemaker, 1948

		Ceradocus shoemakeri Fox, 1973
		Elasmopus rapax (Costa, 1853)
		Elasmopus thomasi Ortiz & Lalana, 1994
		Elasmopus sp.
		Maera sp.
		Maeracoota galani Krapp-Schickel & Ruffo, 2001
		Meximaera diffidentia Barnard, 1969
		Quadrimaera pacifica (Schellenberg, 1938)
		Spathiopus looensis Thomas & Barnard, 1985
	Megaluropidae	*Gibberosus myersi* (McKinney, 1980)
	Melitidae	*Dulichiella lecroyae* Lowry & Springthorpe, 2007
		Melita planaterga Kunkel, 1910
	Neomegamphopidae	*Neomegamphopus hiatus* Barnard & Thomas, 1987
	Nuuanuidae	*Nuuanu muelleri* Ortiz, 1976
	Phliantidae	*Pariphinotus seclusus* (Shoemaker, 1933)
	Photidae	*Audulla chelifera* Chevreux, 1901
		Gammaropsis sutherlandi Nelson, 1980
		Photis sp.
		Rocasphotis sp.
	Podoceridae	*Podocerus fissipes* Serejo, 1995
		Podocerus kleidus Thomas & Barnard, 1992
	Pontogeneiidae	*Nasageneia yucatanensis* (McKinney, 1980)
	Talitridae	*Tethorchestia antillensis* Bousfield, 1984
	Unciolidae	*Rudilemboides naglei* Bousfield, 1973

Temporal coverage

Data range: 2009-8-01 - 2011-10-17.

Usage rights

Use license: Other

Data resources

Data package title: Benthic amphipods from Alacranes Reef, Campeche Bank, Mexico

Resource link: http://ipt.iobis.org/caribbeanobis/resource?r=anfipodosbentonicos_bancodecampeche_mexico

Alternative identifiers: http://ipt.iobis.org/caribbeanobis/archive.do?r=anfipodosbentonicos_bancodecampeche_mexico

Number of data sets: 1

Data set name: Benthic amphipods from Alacranes Reef, Campeche Bank, Mexico

Character set: UTF-8

Data format: Darwin Core Archive (DwC-A)

Data format version: 1.0

Description: The dataset presents an occurrence data sheet with 15 columns including information for 588 records.

Column label	Column description
eventID	An identifier for the set of information associated with an Event (something that occurs at a place and time).
basisOfRecord	The specific nature of the data record.
occurrenceID	An identifier for the Occurrence (i.e. number of collection catalogue).
individualCount	The number of individuals represented present at the time of the Occurrence.
occurrenceStatus	A statement about the presence or absence of a Taxon at a Location.
associatedReferences	An identifier (i.e. Digital Object Identifier, DOI) of literature associated with the Occurrence.
samplingProtocol	The name of, reference to, or description of the method or protocol used during an Event.
eventDate	The date-time or interval during which an Event occurred.
decimalLatitude	The geographic latitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic centre of a Location.
decimalLongitude	The geographic longitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic centre of a Location.
identificationQualifier	A brief phrase or a standard term ("cf.", "aff.") to express the determiner's doubts about the Identification.
scientificNameID	An identifier for the nomenclatural (not taxonomic) details of a scientific name (i.e. AphiaID).

scientificName	The full scientific name.
taxonRank	The taxonomic rank of the most specific name in the scientificName.
taxonRemarks	Comments or notes about the taxon or name.

Acknowledgements

To Dr. Ana Carolina Peralta (Universidad Simon Bolivar, Venezuela) by her valuable guide for management our data into GBIF and OBIS. We also thank to Dr. Robert Mesibov for valuable technical evaluation on the Data Quality Checklist draft and two reviewers (Dr. Kristine White and Dr. Yasen Mutafchiev) for useful suggestions.

References

- CONANP (2006) Programa de conservación y manejo. Parque Nacional Arrecife Alacranes, Mexico. Comision Nacional de Areas Naturales Protegidas (CONANP), México. URL: http://www.conanp.gob.mx/que_hacemos/programa_manejo.php
- González-Muñoz R, Simões N, Tello-Musi JL, Rodríguez E (2013) Sea anemones (Cnidaria, Anthozoa, Actiniaria) from coral reefs in the southern Gulf of Mexico. ZooKeys 341: 77-106. https://doi.org/10.3897/zookeys.341.5816
- LeCroy SE (2000) An Illustrated Identification Guide to the Nearshore Marine and Estuarine Gammaridean Amphipoda of Florida. Volume 1. Families Gammaridae, Hadziidae, Isaeidae, Melitidae and Oedicerotidae . Florida Department of Environmental Protection, Tallahassee, 195 pp.
- Liceaga-Correa MA, Hernández-Núñez H (2000) Localización y dimensiones del arrecife Alacranes. Jaina 11: 8-10.
- Lowry JK, Stoddart HE (1997) Amphipoda Crustacea IV. Families Aristiidae, Cyphocarididae, Endevouridae, Lysianassidae, Scopelocheiridae, Uristidae . Memoirs of the Hourglass Cruises 10: 1-148. URL: http://myfwc.com/research/publications/scientific/hourglass-cruises/
- Lowry JK, Myers AA (2017) A phylogeny and classification of the Amphipoda with the establishment of the new order Ingolfiellida (Crustacea: Peracarida). Zootaxa 4265 (1): 1. https://doi.org/10.11646/zootaxa.4265.1.1
- Myers AA (1981) Amphipod Crustacea I, Family Aoridae . Memoirs of the Hourglass Cruises 5: 1-75. URL: http://myfwc.com/research/publications/scientific/hourglass-cruises/
- Ortiz MT, Winfield IA, Scheinvar GE, Cházaro OS (2014) Clave Ilustrada de anfípodos del Golfo de México y el Mar Caribe (Gammaridea y Caprellidea). Universidad Nacional Autónoma de México, Facultad de Estudios Superiores de Iztacala, Mexico, 252 pp.
- Paz-Ríos CE, Simões N, Ardisson PL (2013a) Records and observations of amphipods (Amphipoda: Gammaridea and Corophiidea) from fouling assemblages in the Alacranes Reef, southern Gulf of Mexico. Marine Biodiversity Record 6: e90. https://doi.org/10.1017/S175526721300064X

- Paz-Ríos CE, Simões N, Ardisson PL (2013b) Intertidal and shallow water amphipods (Amphipoda: Gammaridea and Corophiidea) from Isla Pérez, Alacranes Reef, southern Gulf of Mexico. Nauplius 21: 179-194. https://doi.org/10.1590/S0104-64972013000200005
- Paz-Ríos CE, Guerra-García JM, Ardisson PL (2014) Caprellids (Crustacea: Amphipoda) from the Gulf of Mexico, with observations on *Deutella mayeri*, redescription of *Metaprotella hummelincki*, a taxonomic key and zoogeographical comments. Journal of Natural History 48: 2517-2578. https://doi.org/10.1080/00222933.2014.931481
- Ramírez-Hernández A, Hernández-Alcántara P, Solís-Weiss V (2015) *Nereis alacranensis*, a new species of polychaete (Annelida, Nereididae) from Alacranes Reef, southern Gulf of Mexico, with a key to *Nereis* from the Grand Caribbean. Zootaxa 4012 (1): 156. https://doi.org/10.11646/zootaxa.4012.1.8
- Reyes-Gómez A, Ortigosa D, Simões N (2017) Chitons (Mollusca, Polyplacophora) from Alacranes Reef, Yucatan, Mexico. ZooKeys 665: 1-36. https://doi.org/10.3897/zookeys.665.10476
- Santana-Moreno LD, Grave SD, Simões N (2013) New records of caridean shrimps (Decapoda: Caridea) from shallow water along the northern Yucatan Peninsula coasts of México. Nauplius 21 (2): 225-238. https://doi.org/10.1590/s0104-64972013000200009
- Tunnell JW, Chávez EA, Withers K (Eds) (2007a) Coral Reefs of the Southern Gulf of Mexico. Texas A & M University Press, Corpus Christi, 194 pp. [ISBN 978-1-58544-617-9]
- Tunnell JW, Barrera N, Beaver CR, Davidson J, Gourley JE, Moretzsohn F, Nañez-James S, Pearce JJ, Vega ME (2007b) Checklist of the biota associated with Southern Gulf of Mexico coral reefs and coral reef islands. http://www.gulfbase.org/checklist/. Accessed on: 2012-8-03.
- Ugalde D, Gómez P, Simões N (2015) Marine sponges (Porifera: Demospongiae) from the Gulf of México, new records and redescription of *Erylus trisphaerus* (de Laubenfels, 1953). Zootaxa 3911 (2): 151. https://doi.org/10.11646/zootaxa.3911.2.1
- Wilkinson T, Wiken E, Bezaury-Creel J, Hourigan T, Agardy T, Herrmann H, Janishevski L, Madden C, Morgan L, Padilla M (2009) Marine Ecoregions of North America. Commission for Environmental Cooperation, Montreal, 200 pp.
- Winfield I, Escobar-Briones E, Álvarez F (2007) Clave para la identificación de los anfípodos bentónicos del Golfo de México y el sector norte del Mar Caribe. Universidad Nacional Autónoma de México, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Mexico, 197 pp.